AI in Science Remit FAQs

What is the AI in Science remit?
-- Here 'AI' is interpreted very broadly, that is including topics in Bayesian Inference and Robotics, with 'Science' covering any typical topic in Natural Science and Engineering. Epidemiology, Biology and basic science in biomedicine are included but clinical medical themes, including conventional medical imaging, are not covered.

Example topics include Bayesian optimization for molecular or materials design; machine learning for single cell data; physics-based ML for turbine design; satellite imaging to predict disease risk; and Astrostatistics.

These posts are not suitable for research into generic AI with general application: candidates must be aiming to substantially advance a *particular* area of science. Applicants could view themselves as AI researchers tackling a particular piece of Science or Science researchers using AI to transform their area. *A deep knowledge of AI is not a precondition for this fellowship: only an appreciation of the need for AI and a willingness for skill acquisition in AI.*

It is anticipated that Schmidt Sciences support for IRFs within the AI in Science theme could be allocated in the Faculties of Medicine, Natural Sciences and Engineering.

Does the AI in Science remit cover the social sciences and humanities?
-- We do include epidemiology but outside this no: the grant's principal orientation is towards Natural Sciences and Engineering.

Does the AI in Science remit cover medical research?
--'Science' covers any typical topic in Natural Science and Engineering. Epidemiology, Biology and basic science in biomedicine are included but, aside from Epidemiology, clinical medical themes including conventional medical imaging, are not covered. We are pleased to support medical research that attempts to understand a biological system/process including a pathophysiological process/state. Our centre does not seek to support translational medical research or the development of therapeutic technologies. A proposal can certainly connect to therapy and technology, but this should not be the principal objective of the fellowship.

How central does AI need to be for my proposal?
It needs to be an essential/catalytic component of the proposal and not an add-on which, upon removal, would leave the science unchanged. In a successful proposal, removing the AI (note our broad definition of AI) would severely compromise the whole project because it is through the use of AI that the scientific goal is being achieved.

I am a scientist/engineer with an introductory grasp of AI, but an idea of how it might make a difference to my field, can I apply?
-- Yes! Deep knowledge of AI is not a precondition for applying -- the IRF supported by Schmidt Sciences can help you pivot into acquiring AI skills to advance your disciplinary area. Please consider selecting your sponsor(s) and designing your research and training programme accordingly.

I am an AI researcher, with an introductory grasp of an area of science/engineering, but an idea of how AI might make a difference to that area, can I apply?
-- Yes! Deep knowledge of the scientific area is not a precondition for applying -- the IRF supported by Schmidt Sciences can help you pivot into acquiring deeper subject area expertise. Please consider selecting your sponsor(s) and designing your research and training programme accordingly.

I am an AI researcher, and I look at a number of application areas, can I apply?

Yes! Critically you should view this fellowship as an opportunity to pick *one* application area and pivot into gaining a much *deeper* mastery of it -- you cannot cover multiple application areas in different fields within the fellowship. You might want to pick your mentors and design your training program accordingly.

I already do AI for new Science, can I apply?
-- Yes! You would need to cover how the AI you do is somewhat distinctive and not very widespread in the subfield.

In my area of science, we use particular AI tools as a matter of conventional scientific practice: is my work within remit if I use those routine tools?
-- In some scientific subfields there are now very well-established AI tools, and the use of these particular AI tools could be considered 'completely routine,' 'standard practice appearing in almost all papers within the scientific subfield' or 'very widely used.' These ICRFs supported by Schmidt Futures are broadly intended to unlock *new areas of science through AI*. While we appreciate that this is a grey area, we ask candidates to clarify if they are proposing a different set of AI tools to those that are very well established (or developing new AI tools) with the goal of unlocking new science; or taking some kind of distinctive approach; or that their approach is not very standard practice. A particular use of AI that is standard practice in one subfield might be rare in another (perhaps close) subfield. For any given AI approach our fellowship favours the application of an AI approach to a subfield in which it is more rarely used.

Can the boundary between AI and Science be clarified?
-- This fellowship is not about supporting researchers that already do generic AI to continue doing more of their work without strong engagement with specific disciplinary concerns outside their current area in generic AI. AI includes topics like inference, robotics, control, signal processing, AI hardware. Science explicitly excludes topics within the AI as defined in the preceding sentence. For example, a project is not within the AI in Science remit if it uses new ideas from signal processing to develop robotics or new Machine Learning to improve robotic control or Bayesian Optimization to Improve AI Hardware -- these would be 'AI in AI' projects. Research projects that seek to develop better AI by studying the brain are also outside remit (Science for AI).

What parts of mathematics count as AI and what parts count as Science?
-- An answer through examples is easier. A researcher in algebraic geometry might want to use the fellowship to pivot into acquiring AI skills to allow development of theorem proving assistants in algebraic geometry. Or a fellow might use large libraries of solutions to equations and develop AI tools to make sense of them. In both cases insight into specific mathematical structures is gained by using AI and thus is within remit. A possible heuristic is to ask -- "am I trying to use AI to (ultimately) make a mathematical discovery?" A researcher with a focus on PDEs might use the fellowship to use AI (e.g. physics-based ML) for a *specific* scientific or engineering challenge (nominal engagement with a specific area is insufficient). Many areas like Astrostatistics, Biomathematics, Climate Mathematics or Engineering Mathematics often already straddle both AI and Science and so will often be straightforwardly within remit (providing that AI is used to advance some particular area of Science). Statistics with generic application areas is not in remit; method development with generic application areas is not in remit.

Further Questions
If you have specific questions on the AI in Science remit, then please contact Eileen Boyce, IX Centre for AI in Science Manager @ e.boyce@imperial.ac.uk